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DEVICE FOR DISPENSING FROM A BLISTER PACK

This invention relates to a pack containing medicinal tablets. The invention relates in particular to packs that comprise one or more pockets into which one or more tablets may be packed.

It is known to pack tablets in blister packs made of a plastics material such as polyvinyl chloride (PVC) or polypropylene (PP). Such packs are shaped to have a plurality of pockets into which an individual tablet is contained. The pack is sealed by for example a sheet of foil. When a consumer needs to take a tablet, they simply push the pocket containing the tablet up towards the sheet of foil, forcing the tablet through the foil thereby breaking the seal and releasing the tablet. All other tablets remain in respective pockets that remain sealed. In the terminology used in the packaging art, blister packs of this type are known as primary packaging.

In order to enable a consumer to push a tablet through the sheet of foil, the blister pack is made of a highly flexible material, such as PVC or PP. Due to the material properties, the PVC or PP must be thin in order to allow sufficient flexibility and to ensure that the pocket may be sufficiently deformed by a force easily applied by a consumer. Because of the flexibility of the pack, it is necessary to protect the pack from damage whilst at the point of sale and before a consumer has purchased the pack. It is known therefore to pack the blister pack in an outer pack. In the terminology used in the packaging art, such outer packs are known as secondary packaging. The secondary packaging is often in the form of a cardboard box, for example.

A problem with existing packs of this type is that the packaging is relatively expensive since both primary and secondary packaging are required.

A further problem is that the blister units, and the second packaging if retained, tend to become rather untidy looking in use. Furthermore sometimes tablets pierce the foil sheet inadvertently, for example when in a pocket or handbag.

According to a first aspect of the invention there is provided a pack of medicinal tablets, the pack comprising a base wall which defines a plurality of locations for the tablets, wherein at each such location there is a displaceable pocket which constitutes a recess for a tablet, a cover piece of a rupturable material and a tablet between the displaceable pocket and the cover piece, wherein the pack is of a sufficiently rigid construction as to be resistant to permanent deformation.

By "medicinal" herein we mean to include vitamin products, other health supplement products and veterinary products. However the tablets are preferably pharmaceutical products (for human health), most preferably analgesics, for example aspirin, paracetamol and ibuprofen.

By "tablets" herein we mean to include all individualised solid-form medicinal products, including lozenges.

Preferably the pockets are integral with the base wall. Each pocket is preferably upstanding from the rest of the base wall. For convenience the term "pocket" is used herein to denote any displaceable region able to retain a tablet.

Preferably each pocket is displaceable from its upstanding position on application of a force by a user, so as to expel a tablet through the cover piece.

Suitably each pocket is hinged to the base wall.

Preferably the base wall is of a sufficiently rigid construction as to be resistant to permanent deformation. It may advantageously be elastic, such that it can be reversibly flexed.

Alternatively or additionally the pack comprises a frame around the base wall and the frame is of a sufficiently rigid construction as to be resistant to permanent deformation.

According to a second aspect of the invention there is provided a medicinal tablet pack comprising:

- a base wall resistant to permanent deformation;
- 5 - a plurality of pockets formed in the base wall;
- a tablet in each pocket; and
- a cover piece of a rupturable material over the pockets;

wherein the pocket is displaceable so as to expel a tablet from the pocket, through the cover piece.

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According to a third aspect of the invention there is provided a medicinal tablet pack comprising:

- a base portion, and
- a pocket comprising an open end, and an opposite closed end, the pocket
- 15 retaining a medicinal tablet, the pocket being attached to the base portion at an intersection between the base portion and the pocket wall;

characterised in that the pocket wall comprises a hinge at or in the vicinity of the intersection between the pocket and the base portion.

20 The definitions which follow may apply to any aspect of the present invention unless the context demands otherwise.

In one embodiment having pockets integral with the base wall or base portion naked tablets are located in the pockets, and are retained therein by the cover piece.

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In another embodiment having pockets integral with the base wall the tablets are provided in a blister pack (e.g. of standard type, typically weak and flexible), with the tablets in the blister pack in register with the pockets. The blister pack is located with its tablets within the pockets and a retention means - of which very many are possible -

30 is provided to hold the blister pack in place. In effect the blister pack serves as a convenient way of locating the tablets in place, in the pockets.

In another embodiment the base wall has openings which correspond to the locations for the tablets, and the recesses are those of a blister pack (e.g. of standard type; typically weak and flexible) located against the base wall, with its blisters protruding through the openings, and functioning as the displaceable pockets. A retention means
5 - of which very many are possible - is provided to hold the blister pack against the base wall. In effect the base wall supports the blister pack, preventing it from distorting. The blister pack may be permanently secured in place - the pack being disposable - or may be intended to be replaced by a new blister pack, once it is empty.

- 10 Preferably, the pack comprises more than one pocket. Preferably it comprises 4 to 16 pockets, preferably 6 to 12.

Conveniently, the or each pocket is adapted to hold one tablet only. Alternatively the pocket may hold more than one tablet. This may be useful if the usual dose taken at
15 one time is more than one tablet. For example, if the usual dose of a particular tablet is three at one time, then a pocket may hold three tablets.

The pack according to the invention obviates the need for a secondary packaging such as in the form of a carton. The pack therefore may also serve as a brand carrier.

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The pack may also serve as an information carrier and as such is able to impart important medicinal information to the consumer. The information may relate to dosage, contra-indications and safety for example.

- 25 The information may be applied directly to the pack by, for example, screen printing, or labelling, or may be applied to a leaflet affixed to or carried by the pack.

Preferably, the pack further comprises a cover piece, serving as a sealing portion, preferably in the form of a sheet extending over the open end of the pocket to close the
30 open end.

The cover piece may suitably be a readily frangible material; suitably a readily frangible material which has little resistance to tearing, once it has been pierced. Preferably it is of thin metallic foil material.

5 A pocket may be closed over by an individual cover piece but preferably all the pockets of the pack are closed over by a single cover piece, such that its breach by a tablet at one pocket does not compromise its closure over other pockets, still containing tablets.

10 Preferably the base wall, and the pocket when integral therewith, is formed from a polymer, preferably a thermoplastic, for example polypropylene (PP).

The tablet may be released from the pack by applying a force to the protruding end of the pocket. This causes the pocket to deform, pushing the protruding end towards the
15 cover piece. This in turn causes the tablet to be pushed through the cover piece, and hence to be released from the pack.

The pack as a whole, and the pocket in particular, must be sufficiently rigid to protect the tablet whilst the pack is in transit between the manufacturer and the wholesaler,
20 and also between the wholesaler and the retailer. In addition it must be strong enough to prevent accidental expulsion of the tablet, for example while being carried around by a consumer.

On the other hand the pocket must be sufficiently deformable to enable a consumer to
25 easily push the pocket to displace it, to force the tablet within the pocket through the cover piece, allowing release of the tablet.

The hinge (when present) forms a "weak" bridge between the base wall and the pocket. This reduces the level of force that is required to displace the pocket.

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A hinge may be formed from a web of wall material which is thinner in cross-section than the parts it connects together, namely the material of the base wall and the

material of the pocket. Preferably the web extends substantially around the circumference of the pocket. Alternatively, the hinge may be formed by a web which runs only partially around the circumference of the pocket. Alternatively the hinge may be formed from a plurality of thinner webs which are positioned at spaced apart intervals around the circumference of the pocket.

A hinge may be formed from a region of the wall having a variable thickness over a predetermined portion of the wall.

10 Preferably a hinge is integrally formed with the wall. Alternatively it is separately formed.

Advantageously, the or each pocket is substantially dome shaped. When a consumer wants to take a tablet, the consumer applies pressure to the pocket displacing it towards the sealing portion. This movement causes the tablet to be forced through the sealing portion, releasing the tablet.

When a pocket is domed shaped and a hinge is provided, when a force is applied to the dome the hinge allows relative movement of the pocket and the base wall, and the result of applying a force to the dome is that the dome inverts under the force applied, thus causing the dome to move towards the cover piece. As the pressure is applied, the deformation of the dome will reach a point where the dome inverts or "flips" so that it becomes convex rather than concave.

25 Preferably, the pack is designed such that inversion of the pocket causes it to "over centre" about the hinge. The pocket will therefore remain in the inverted position after the tablet has been forced out of the pocket. This can be particularly useful in providing a consumer with a visual indication that the tablet within a particular pocket has already been released.

30 In accordance with a further aspect of the invention there is provided a method of manufacturing a pack of one of the preceding aspects.

Advantageously, the pack is formed from injection moulding. This allows accurate shaping of the pack to be achieved. In addition it allows the thickness of the wall to be varied as required.

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It had previously been thought that it would not be possible to use injection moulded PP to make a pack for containing tablets.

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Advantageously, the pack is moulded so that the pockets are formed in their inverted position. The pockets are then forced into their non-inverted or as-sold state after moulding. This means that the hinges are pre-stressed and thus a plastics "living" hinge is formed. This in effect means that the PP molecules have arranged themselves linearly during the stressing process and this further reduces the force which is required to invert the pocket and force the tablet from the pocket.

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The pockets may be forced into their non-inverted state by means of mechanical or hydraulic force for example, by a pressurised air jet.

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Preferably the pocket is stable in each of the positions described herein. It will not change from the starting or non-inverted position to the inverted position without application of a sufficient force to displace the pocket; and vice-versa. Thus the pockets may be regarded as bistable.

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As noted above each pocket may comprise further wall portions that are thinner in cross-section. These portions further reduce the force required to invert the pocket, whilst still allowing the pocket to be formed generally from a thicker layer of plastics material which will provide sufficient protection for the tablet.

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Conveniently, the further areas of reduced wall thickness comprise one or more concentric rings extending circumferentially around the pocket, and being spaced apart axially from another.

The pack may be joined to another pack, to form a pack assembly. In particular a pack assembly may comprise two packs of any aspect of the present invention, but preferably identical, joined together, preferably by a hinge, so as to have a stowed configuration in which tablets cannot be expelled and an opened configuration in which tablets can be expelled. Preferably the cover pieces of the packs are in face-to-face relation when the pack assembly is in its stowed configuration.

The invention is particularly useful for forming a pack that serves as both the primary and the secondary packaging, thus obviating the need for a secondary packaging. The pack then acts as a brand and/or information carrier. However, the pack according to the invention may also be used as a primary packaging which can be placed inside a secondary packaging.

The invention will now be further described by way of example with reference to the accompanying drawings in which:

Figure 1 is a schematic representation of a part-assembled pack according to a first embodiment of the present invention in which a pack of the invention retains a standard blister pack;

Figure 2 is a schematic representation of the assembled pack of Figure 1 before any tablets have been removed from the pack;

Figure 3 is a detailed representation of a pocket of the pack of Figures 1 and 2 with the tablet sealed within the pocket;

Figure 4 is a schematic representation of a pocket of Figure 1 showing the tablet being pushed out of the pocket;

Figure 5 and 6 are schematic representations of a pack according to a second embodiment of the present invention in which the pack contains naked tablets, not a blister pack;

Figure 7 is a schematic representation of the pack of Figures 5 and 6 showing a user applying a force to the pack in order to push a tablet out of a pocket;

Figure 8 is a plan view of a third embodiment of pack of the present invention;

Figure 9 is a side elevation of the pack of Figure 8, partially open; and

Figure 10 is a perspective view of the pack shown in Figures 8 and 9, shown partially open.

Referring to Figures 1, 2, 3 and 4, a pack according to the present invention is designated generally by the reference numeral 10. The pack comprises a base wall 11 and a plurality of pockets 12. The pockets are located so that a standard blister pack 20 may be laid with its tablet protrusions or blisters within the pockets. The foil closure sheet of the blister pack is shown as 13. The base wall 11 and pockets 12 are integrally formed from a polymer such as polypropylene (PP). The pack may be formed by any appropriate means but preferably is formed by injection moulding.

Each pocket 12 comprises a pocket wall 14 of a predetermined thickness. The pocket intersects with the base wall 11 at a hinging wall 15. The hinging point may be formed from an area of the pocket wall which is thinner in cross-section than the remainder of the pocket wall, and allows the pocket 12 to move relative to the base wall 11.

Each pocket 12 is substantially dome-shaped, and when a consumer wants to access a tablet 16 contained within the pocket 12, the consumer merely has to apply force to the pocket 12 causing the pocket to hinge about the hinging point 15 thus causing the dome to invert as shown in Figure 4. This causes the tablet to be pushed through the foil 13.

The pocket comprises a concentric ring 19 in which the pocket wall is of reduced thickness. The ring 19 reduces the force required to deform the dome.

The blister pack may be held firmly in place in the pack by means of securement tabs (not shown) under which the periphery of the blister pack may be secured at intervals, the blister pack being flexed into place.

As the pocket 12 is urged in the tablet-expelling direction by the force applied by a user, the pocket 12 flexes and "over centres" at the hinging point 15. Thus the dome inverts and it remains inverted. This allows the customer a visual means of identifying

how many tablets are left in the pack since it is clear that any pockets which are inverted no longer contain a tablet.

With reference to Figures 5 to 7, a second embodiment of the invention is shown.

5. Parts of the pack which correspond to parts shown in Figures 3 and 4 have been allocated the same reference numerals for the sake of clarity.

Referring to the figures, it can be seen that the pack 40 no longer contains a blister pack 20. Rather it contains naked tablets.

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- The hinging point 15 may be formed from an area of the wall having a thinner cross-section or alternatively may be formed by an area of the wall having a variable cross-section. The base wall 11 is thinner than that of the first embodiment, but still thicker than the thickness of the pocket 14 and hinge 15. The pocket does not have the concentric ring 19, but nevertheless also "over centres". The foil 13 is configured as individual foil portions secured over respective pockets, but could be a single sheet adhered over all of the pockets of the pack.

- Turning to Figure 7, showing the pack of the second embodiment, it can be seen that the operation of releasing a tablet 16 from a pocket 14 may be achieved with one hand of the consumer while the other hand holds the pack in place.

- The most obvious difference between the pack of the third embodiment shown in Figures 8 to 10 and those of the first and second embodiments is that, in fact, it is a pack assembly, having two "packs" 60, 62 which are connected together by a hinge 64. Each pack 60, 62 is of the type shown in Figures 1-4, in that it comprises a pre-formed blister pack laid into an array of 6 recesses, the pockets of which are clearly denoted by the integer 66, in any of Figures 8 to 10. The foil sheet of one of the blister packs can be seen as 68 in Figure 10.

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It will be apparent that the pockets 66 face outwardly when the pack assembly is closed, and thus that the foils 68 are in face-to-face relation when the pack assembly is closed.

5 It will be observed in Figure 9 that on one of the packs the middle row of pockets cannot be seen in side view. This is because they have been displaced inwardly in order to expel their contents, the medicinal tablets. It will also be observed that in Figure 10 the foil sheet is shown as being breached in the corresponding locations 70, 72.

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The two packs are brought together after use, in order to be put in a pocket, handbag or medicine cupboard, for example, and in the closed position a latching arrangement (not shown) operates to prevent ready separation of the two packs. The latter mechanism may be a simple mechanical interaction between the two parts, whereby an opening
15 force applied by an adult can open the pack assembly. A small lip formation may be seen on each pack at 74, 76, to assist opening.

The packs described are preferably for carrying and dispensing analgesic tablets, for example NSAID analgesic tablets, notably ibuprofen.